

**Work Order ID 72940**

Thursday, August 18, 2011 1:39:53 PM

Page 1

Item ID: D205-634-041

Accept

Setup Start

Revision ID:

Stop

Item Name: Replacement Skidtube

Start Date: 8/18/2011 Start Qty: 1.00

Required Date: 9/5/2011 Req'd Qty: 1.00

Cust Item ID:

Customer:

Reference:

Approvals:

Process Plan:

Date: 8/18/11

Tooling:

Date:

Run Start

QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

Draw Nbr

Revision Nbr

D2580-041

Rev.D DEO-D1

100

0.00



DOCUMENT CONTROL

DC

Memo

0.00

Document Control

Photocopy D205-634 bluefile &amp; type labels per PPP D205-634-041 CHG002

N/A

110

0.00



CNC Bend I

BENDING MACHINE - SKIDTUBES

Memo

0.00

CNC Delta 100 Bender

1-Bend as per program D2580.C on CNC Bender and Folio 16

BE 11/08/22

2-Cut tubes as per Dwg. D2580

3- scribe batch# in aft end of tube

SAD 11-08-22

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

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Run Start



QC: Date: SPC (Y/N): Date:

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
120		0.00							
Skidtubes	Memo	0.00							
Skidtubes	1- Deburr ends and remove bending marks								
	2- Prepare tube for welding as per QSI 004								
130	QC5- Inspect part completeness to step on W/O	0.00							
QC	Memo	0.00							
Quality Control									

①

B11/08/23

8/18/24

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

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Approvals: Process Plan: Date: Tooling: Date:

Stop



QC: Date: SPC (Y/N): Date:

Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Tool ID

Tool #

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

140

0.00



Skidtubes

Skidtubes

Memo

0.00

1-Weld step D2576 as per Dwg. D2580 and QSI 004  
A/R□□□ Aluminum Rod

*M115778*

*BE 11/03/24*

2-Grind welds on step as per Dwg D2580

3-Weld spacers as per dwg D2580

*BE 11/08/24*

*M115778*

3- \*\*\* N/A\*\*\*\* Insert D4202-1 spacer, swage as per QSI002 and trim/ grind  
flush per QSI002 and dwg. Hold x-bolt with DT9701 Use tube expander 1/2  
x17G to start expansion and finish with 1/2 x 18G to achieve dwg dimension.

4-Drill holes for wearplates using DT 8217 & DT8937 Open holes to 19/64",  
adjust stopper not to hit web. Deburr

*3 OK 11/08/24*

6-Drill pilot holes for aft cap using DT 8215 Open holes to 0.208". Deburr

7-Drill pilot holes for Tow ring using DT8091. open to .640" and Deburr

*BE 11/08/25*

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Date:

QC:

Date:

SPC (Y/N):

Date:

Run

Start

Stop

Sequence ID/  
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DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

150

QC10- Inspect visual per QSI004- ground welds

0.00

QC

Memo

0.00

Quality Control

160

QC5- Inspect part completeness to step on W/O

0.00

QC

Memo

0.00

Quality Control

170

Pressure Wash per QSI005 4.3

0.00

HandFinish

Memo

0.00

Hand Finishing

Re-alodine tube as per QSI 005 section 4.1.2.1 do not acid etch and leave fwd cap out of solution.

X O M-L 11/08/29

W/O:		WORK ORDER CHANGES					
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Customer:

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Run Start



QC: Date: SPC (Y/N): Date:

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
180  Powdercoat Powder Coating	White Gloss(Ref:4.3.5.1) per QSI005 4.3-Alum	0.00							
<div><div>m 117745</div><div>Memo START TIME: 2:45 OVEN TEMPERATURE: 3200F FINISH TIME: 3:15</div></div>									
190  QC Quality Control	QC3- Inspect Part Finish	0.00							
<div><div></div><div>Memo</div></div>									

X ~~Q~~ m 11/08/29

1 ~~Q~~ M 11/08/31

W/O:		WORK ORDER CHANGES					
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Customer:

Reference:

Run Start



Approvals: Process Plan:

Date:

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

200

0.00



HandFinish

Memo

0.00

Hand Finishing

1-Install inserts &amp; wearplates &amp; Gaskets as per Dwg. D2580. Use a drop of Sikaflex on insert holes before installing wearplates

A/R ☐ ☐ ☐ ☐ Sikaflex-291 M118393Sikaflex expire date: 12/03

2-Coat D2594-3 O' rings with Petroleum Jelly and install on D2594-1 plugs as per Dwg D2580

3-Inspect for foreign object per QSI 024

4-Install 2855 Aft Cap as per Dwg D2580 and seal Fwd Step &amp; Aft Cap with

Sikaflex. Clean excess adhesive

A/R ☐ ☐ ☐ ☐ Sikaflex-291 M118393Sikaflex expire date: 12/05

5-Wing Walk as per Dwg D2580 and QSI 005 4.4

Batch: M1183131 of M118393

W/O:		WORK ORDER CHANGES					
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Required Date: 9/5/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: Date: Tooling: Date:

Run Start



QC: Date: SPC (Y/N): Date:

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

210



QC

Quality Control

QC5- Inspect part completeness to step on W/O

0.00

0.00

8/18/11

Memo

Inspect Aft Cap, Fwd Step and Wing Walk of work to Current Step Inspect for Foreign objects per QSI 024



220



Packaging

Packaging

Packaging

0.00

0.00

Memo

Identify and pack for shipping as per PPPD205-634-041  
Location: \_\_\_\_\_  
PPP Rev: \_\_\_\_\_

PPPD2940

11/8/11 SP

230



QC

Quality Control

QC21- Final Inspection - Work Order Release

0.00

0.00

Memo

11/9/11 JH  
mf 11-09-01

W/O:		WORK ORDER CHANGES					
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Thursday, August 18, 2011 1:39:59 PM

Page 1

Work Order ID: 72940

Parent Item: D205-634-041

Parent Item Name: Replacement Skidtube

Start Date: 8/18/2011

Required Date: 9/5/2011

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:N 02.08.28 FP was QC5 in Step 27; Added QC5 to Step 30  
KJ IPP Rev P 10.02.19  
per PAR09-043 EC verified by:DD  
IPP Rev: O 06.02.28 Added paperwork EC  
IPP Rev:P 07-07-09 SS Wearplates & Gaskets JLM IPP Rev:Q  
10.12.01 as per chg003 DD verf:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
---------------------------------	------------------------	---------------	-------------	---------------------	------------------	-----------------	--------------------	----------------	-------------	--------------	---------------	----------------	--------

D4202-1 <b>D2579</b>		Manufactured	No			140	Each	443.0000	20	20			
----------------------	--	--------------	----	--	--	-----	------	----------	----	----	--	--	--



Spacer

Location	Loc Qty	Loc Code
LG002	443	
66929	106	
67129	196	
67308	1	
67430	140	

D2580-1		Manufactured	No			110	Each	1.0000	1	1			
---------	--	--------------	----	--	--	-----	------	--------	---	---	--	--	--



205 Skidtube bent detail

Location	Loc Qty	Loc Code
LG	1	
71014	1	

D2576-3		Manufactured	No			140	Each	30.0000	1	1			
---------	--	--------------	----	--	--	-----	------	---------	---	---	--	--	--



Step (maching detail)

Location	Loc Qty	Loc Code
LG	30	
66156	30	

BE 11/08/24  
B 72672 20

BE 11/08/22  
B 72840 01

BE 11/08/24

W/O:		WORK ORDER CHANGES					
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Work Order ID: 72940

Parent Item: D205-634-041

Parent Item Name: Replacement Skidtube

Start Date: 8/18/2011

Required Date: 9/5/2011

Start Qty: 1.00

Required Qty: 1.00

D2855 Manufactured No

200 Each

32.0000

1

1



Cap



all 11/08/31

Location

Loc Qty

Loc Code

FP007

32

65519

2

65569

30

X1

AN3-5A Purchased No

200 Each

1,037.000

2

2



all 11/08/31

Bolt

Location

Loc Qty

Loc Code

ST350

1037

115371

46

117423

691

118626

300

X2

AN960JD10L NAS1149D0332J Purchased No

200 Each

0.0000

2

2



1117087

(X2) all 11/08/31

Washer

ALS7-1032-130 Purchased No

200 Each

1,155.000

50

50



all 11/08/31

Insert

Location

Loc Qty

Loc Code

ST282

1155

117717

899

118386

256

1118237

150

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Shop Packet Print

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W/O:		WORK ORDER CHANGES					
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Parent Item Name: Replacement Skidtube

Start Date: 8/18/2011

Required Date: 9/5/2011

Start Qty: 1.00

Required Qty: 1.00

AN3C4A

Purchased

No

200

Each

2,621.000

50

50



BOLT



11/08/31

## Location

## Loc Qty

## Loc Code

ST350

2621

117313

2

117688

36

117795

1

117872

22

118012

20

118112

40

118451

1000

118628

1500

X50

AN960C10L

NAS1149C0332

Purchased

No

200

Each

0.0000

50

50



washer

D3566-13

Manufactured

No

200

Each

27.0000

1

1



Gasket



CV50/ 11/08/31

11/08/31

## Location

## Loc Qty

## Loc Code

FP

8

69281

8

FP014

19

68341

1

72149

18

X1

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Start Date: 8/18/2011

Required Date: 9/5/2011

Start Qty: 1.00

Required Qty: 1.00

D3566-5

Manufactured No

200 Each

26.0000

1

1



Gasket



11/08/31

Location

Loc Qty

Loc Code

FP015

26

68961

1

71601

5

72849

20

D3566-1

Manufactured No

200 Each

32.0000

2

2



Gasket



11/08/31

Location

Loc Qty

Loc Code

FP011

2

71580

2

FP015

30

68924

2

72848

28

D3564-11

Manufactured No

200 Each

16.0000

1

1



Wearshoe



11/08/31

Location

Loc Qty

Loc Code

FP019

2

67591

2

FP020

14

72207

14

1

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Start Qty: 1.00

Required Qty: 1.00

D3564-13

Manufactured No

200 Each

12.0000 1 1



Wearshoe



u/08/31

Location Loc Qty Loc Code

FP016 6

69280 6

FP017 6

71594 6

D3564-9

Manufactured No

200 Each

18.0000 1 1



Wearshoe



u/08/31

Location Loc Qty Loc Code

FP019 6

67590 4

69943 2

FP020 12

72208 12

D3564-5

Manufactured No

200 Each

16.0000 1 1



Wearshoe



u/08/31

Location Loc Qty Loc Code

FG 2

34806 2

FP019 14

70864 2

72164 12

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Required Date: 9/5/2011

Start Qty: 1.00

Required Qty: 1.00

D2594-3

Manufactured No

200

Each

612.0000

16

16



O-Ring, 205 Skidtube



u108131

Location

Loc Qty

Loc Code

FP-A

612

65518

41

66952

571

D2594-1

Manufactured No

200

Each

306.0000

16

16



Plug, 205 Skidtube



u108131

Location

Loc Qty

Loc Code

FP-A

306

42807

28

67441

7

68943

70

72127

201

x16

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

**DART**

DESIGN <i>[initials]</i>	DRAWN BY <i>[initials]</i>	<b>DART AEROSPACE LTD</b> HAWKESBURY, ONTARIO, CANADA	
CHECKED <i>[initials]</i>	APPROVED <i>[initials]</i>	DRAWING NO. D2580	REV. D SHEET 1 OF 3
DATE 07.02.27		TITLE 205 SKIDTUBE ASSEMBLY	SCALE NTS
A	96.09.16	NEW ISSUE	
B	96.12.02	AS MANUFACTURED	
C	98.08.26	REDRAWN, INCLUDED DEO 9094/9097	
D	07.02.27	CHANGE TO SS WEARPLATES AND GASKETS, INCLUDE DEO 9124/9183	

**RELEASED**  
07.06.28 *[initials]***DEO ATTACHED**  
**UNDER REVIEW***P110690*  
RMV *P11.06.30*

QTY -041	QTY -045	Part Number	Description
X		D2580-041	SKIDTUBE ASSEMBLY
	X	D2580-045	SKIDTUBE ASSEMBLY
1	1	D2500-1-190	EXTRUSION
1	1	D2576-3	STEP
20	24	D2579	CROSS BOLT SPACER
16	16	D2594-1	PLUG
16	16	D2594-3	O-RING
1	1	D2596	205 WEB
1	1	D2855	AFT CAP
1	1	D3564-5	WEARSHOE
1	1	D3564-9	WEARSHOE
1	1	D3564-11	WEARSHOE
1	1	D3564-13	WEARSHOE
2	2	D3566-1	GASKET
1	1	D3566-5	GASKET
1	1	D3566-13	GASKET
50	50	ALS7-1032-130 or AKS7-1032-130 or AKS4-1032-130 or AELS-1032-130	INSERT
50	50	AN3C4A	BOLT
2	2	AN3-5A	BOLT
50	50	AN960C10L	WASHER
2	2	AN960JD10L	WASHER

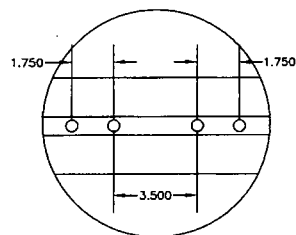
SHOP COPY  
RETURN TO  
ENGINEERING  
UNCONTROLLED COPY  
SUBJECT TO AMENDMENT  
WITHOUT NOTICE  
WORK ORDER  
NO. *129410**P11-08-16***GENERAL NOTES:**

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 2) ALL DIMENSIONS ARE IN INCHES
- 3) INSERT D2596 WEB TO LOCATION SHOWN OFF AFT END OF SKIDTUBE AND BOND WEB INTO OUTER TUBE WITH NON-STRUCTURAL SIKAFLEX-241 ADHESIVE PER DART QSI 015 BEFORE BENDING. ENSURE HOLES LINE-UP.
- 4) BEND AS A SMOOTH RADIUS STARTING WITH A MAXIMUM CENTERLINE RADIUS OF 60 AND ENDING WITH A MINIMUM RADIUS OF 30. A MAXIMUM REDUCTION OF 0.200 IN DIAMETER IS ALLOWABLE IN THE BENT PORTION OF THE TUBE.
- 5) USE DART DRILL TEMPLATE TD2577-205 TO LOCATE AND DRILL Ø0.297 HOLES FOR WEARSHOE INSERTS. INSTALL ALS7-1032-130 PER SECTION D-D (50 PLACES) AFTER FINISH. INSTALL AN3C4A BOLTS AND AN960C10L WASHERS WITH SIKAFLEX-241/-291.
- 6) WELDING TO BE DONE PER DART QSI 004.
- 7) FINISH:  
SEE NOTES ON  
PAGE 2 FOR D2580-041 AND  
PAGE 3 FOR D2580-045
- 8) INSERT D2594-1 PLUG C/W D2594-3 O-RING IN HOLES MARKED 'P' (BOTH SIDES OF TUBE) AFTER FINISH (16 PLACES).

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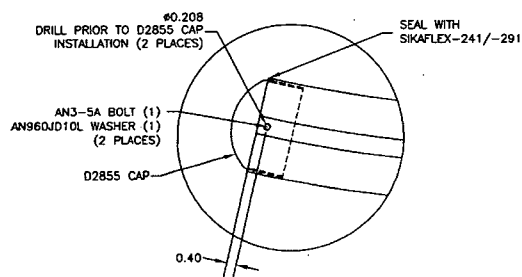
**DETAIL A**  
SCALE 5:24



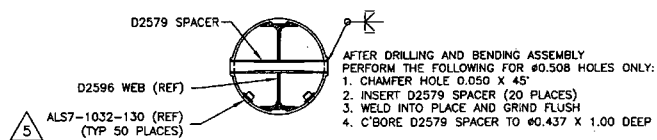
RELEASED  
07-06-28

**DEO ATTACHED**  
RMV 4/11/06 30

**DETAIL C**  
SCALE 5:24



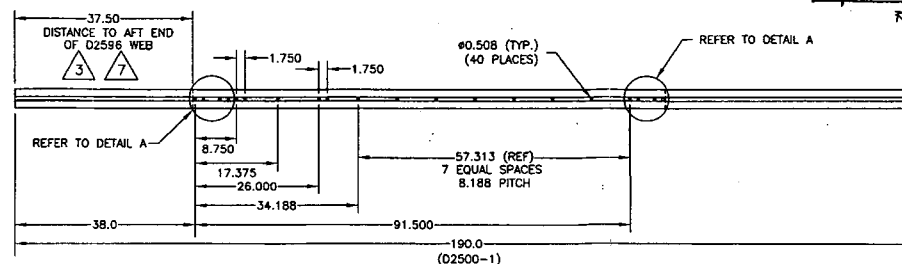
**SECTION D-D**  
SCALE 5:24



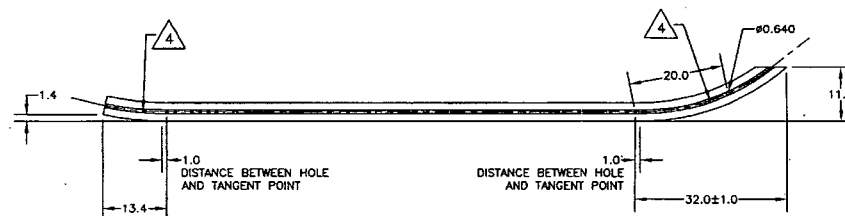
**D2580-041 NOTES**

- i) FINISH: ACID ETCH, ALODINE PER DART CSI 005 4.1 PRIOR TO INSERTING D2596 WEB POWDER COAT ASSEMBLY GLOSS WHITE (REF. 4.3.5.1) PER DART CSI 005 4.3 BLACK ANTI-SKID PAINT AS INDICATED PER DART CSI 005 4.4

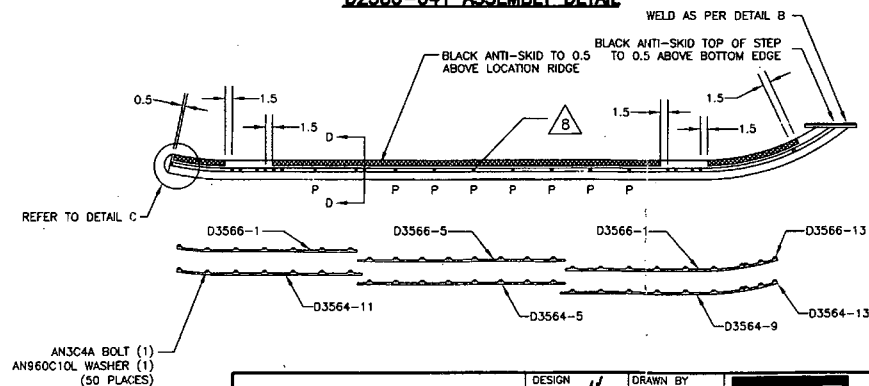
D2580-1 DRILLING DETAIL



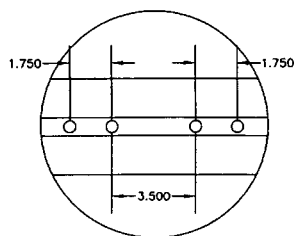
D2580-1 BENDING AND CUTTING DETAIL



D2580-041 ASSEMBLY DETAIL

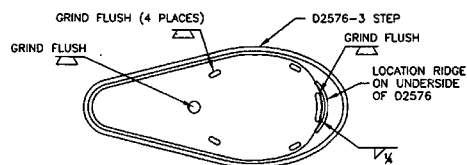


**DETAIL E**  
SCALE 5:24



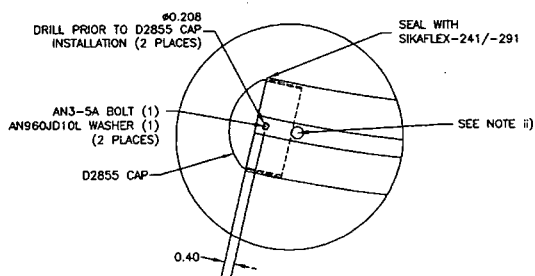
RELEASED  
07-06-28

**DETAIL F**  
SCALE 5:24

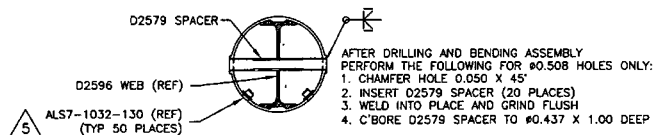


~~DEO ATTACHED~~

**DETAIL G**  
SCALE 5:24



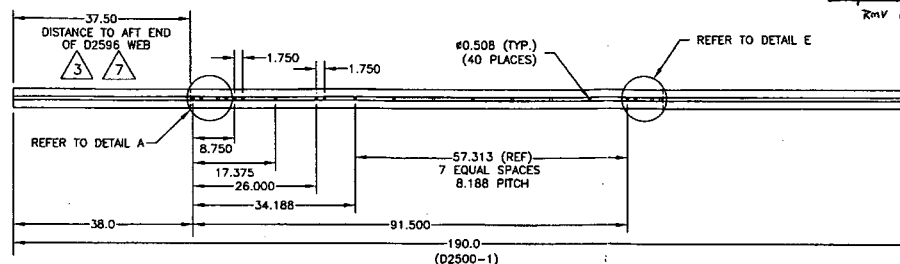
**SECTION H-H**  
SCALE 5:24



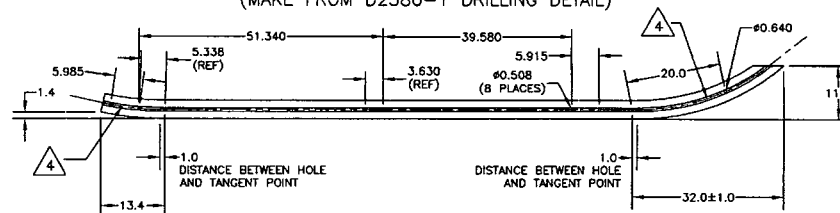
**D2580-045 NOTES**

- i) FINISH: ACID ETCH, ALODINE PER DART QSI 005 4.1 PRIOR TO INSERTING D2596 WEB  
POWDER COAT ENTIRE ASSEMBLY GREEN (REF. 4.3.5.8) PER DART QSI 005 4.3  
BLACK ANTI-SKID PAINT AS INDICATED PER DART QSI 005 4.4
- ii) IT IS ACCEPTABLE TO GRIND A RELIEF IN THE D2855 AFT CAP TO PREVENT INTERFERENCE  
WITH THE SPACER AT THIS LOCATION

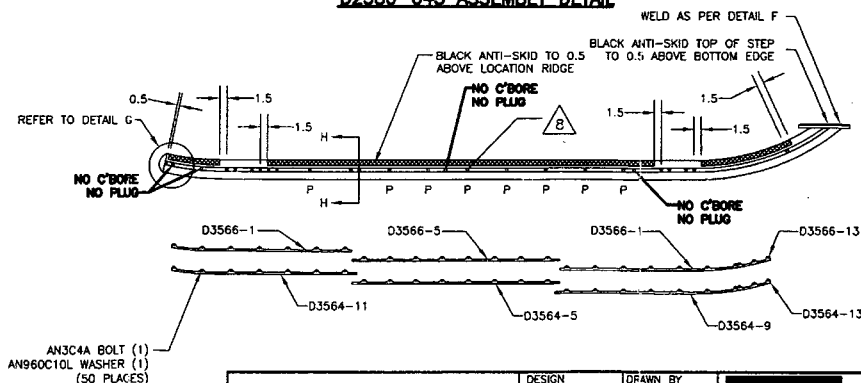
D2580-1 DRILLING DETAIL



**D2580-5 BENDING AND CUTTING DETAIL**  
(MAKE FROM D2580-1 DRILLING DETAIL)



D2580-045 ASSEMBLY DETAIL



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DESIGN
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CHECKED *la*

DATE \_\_\_\_\_

DRAWN BY

APPROVED

**DART**

**DART AEROSPACE LTD**  
HAWKESBURY, ONTARIO, CANADA

DRAWING NO.

D2580

TITLE	
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205 SKIDTUBE ASSEMBLY

REV. 0

SHEET 3 OF 3

SCALE

1:24



NO. 262

AWS D17.1.2001  
QUALIFICATION TEST RECORD

Name: Barclay Elliott  
Job number: B71946  
Part number: D205 634 041  
Description: 205  
Welding Process: Tig ☒ Mig ☐  
Base material: Aluminum  
Current: AC ☒ DC ☐

TEST REQUIREMENTS AND RESULTS

Visual: pass ☒ fail ☐  
Penetration: pass ☒ fail ☐

UNACCEPTABLE

Cracks: pass ☒ fail ☐  
Undercut: pass ☒ fail ☐  
Pin holes: pass ☒ fail ☐  
Overlap (cold lap): pass ☒ fail ☐  
Porosity (surface): pass ☒ fail ☐  
Coloration: pass ☒ fail ☐

Qualifier Barclay Elliott Date of Test Coupon 11-08-11  
Welder Barclay Elliott Date of Test Coupon 11-08-11

The above named individual is qualified in accordance with AWS D17.1.2001 to weld